



KAISER-HILL

INTEROFFICE CORRESPONDENCE

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 SUBJECT NO RADIOACTIVITY ADDED PROGRAM STATUS AND RESPONSIBILITY MLL-039-95

In May, 1991, DOE Headquarters imposed a moratorium on shipment of hazardous and regulated wastes to commercial treatment, storage and disposal facilities. EM-30 subsequently issued the Performance Objective for Certification of Non-Radioactive Hazardous Waste which provides the criteria for unrestricted release of RCRA-hazardous, state-hazardous and TSCA-regulated wastes shipped from DOE facilities to commercial treatment, storage and disposal facilities.

In order to lift the waste shipping moratorium and meet the criteria established in the Performance Objective, Waste Regulatory Programs and Radiological Engineering developed and implemented the "No Radioactivity Added Waste Verification Program (NRA Program)"

During discussions between Kaiser-Hill, Waste Regulatory Programs and Radiological Control personnel, it was determined the NRA Program should become the responsibility of the Radiological Control Manager, given the program consists primarily of Radiological Control procedures to meet the unrestricted release requirements for waste in accordance with DOE Order 5400.5-Radiation Protection of the Public and the Environment, DOE Radiological Control Manual/EH-0256T, 10 CFR Part 835/Occupational Radiation Protection and the Performance Objective.

Subsequently, on July 17, 1995, R Mark Richards of Radiological Engineering will assume programmatic responsibility for the NRA Program at the Rocky Flats Environmental Technology Site.

Should you have any questions or concerns regarding this issue, please contact R Mark Richards at X5148.


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NO-RADIOACTIVITY-ADDED (NRA) WASTE VERIFICATION PROGRAM

 *EG&G ROCKY FLATS*
ROCKY FLATS PLANT
GOLDEN, COLORADO
SEPTEMBER 1993

NO-RADIOACTIVITY-ADDED
VERIFICATION WASTE PROGRAM

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1 EXECUTIVE SUMMARY

The purpose of the No-Radioactivity-Added (NRA) Waste Verification Program is to establish the methodologies and criteria, as outlined in the DOE EM-30 Performance Objective for Certification of Non-Radioactive Hazardous Waste, to determine if a waste is potentially radioactively contaminated.

As most materials have some inherent level of radioactivity, this Program does not determine whether or not the waste is radioactive, but only the potential that DOE controlled radioactive material has been added due to a DOE activity. DOE controlled radioactive material at the Rocky Flats Plant (RFP) is typically plutonium, americium, and uranium (depleted and enriched).

Even though the waste shipping moratorium imposed by DOE, Headquarters was directed primarily at RCRA-regulated and TSCA-hazardous waste, the release criteria applies to all waste generated throughout the Rocky Flats Plant. The NRA Program outlines methodologies to determine if a waste is potentially radioactively contaminated. Once the radiological status of the waste has been determined, the waste is then handled according to the appropriate waste management plan (i.e., Low-Level Waste Management Plan, RCRA Program Description, TSCA Management Plan, etc.). At the current time, all radioactively contaminated waste generated at RFP is disposed of within the DOE Complex. If it is decided that, in the future, radioactive waste will be disposed of at a licensed commercial facility, this Program will be revised accordingly.

There are two methods of determining the radiological status of the waste: process/historical knowledge and radiological analysis. Process/historical knowledge (e.g., point of generation) is the first and primary method used at RFP to determine that a waste is not radioactively contaminated. The second method, radiological analysis, consists of surveying the waste and, if appropriate, taking samples and analyzing for its radiological content. Release surveys are performed in accordance with DOE Order 5400.5.

The establishment of Radioactive Material Management Areas (RMMAs) and non-RMMAs are fundamental to determining, by process/historical knowledge, the radiological status of the waste in question. By definition, wastes generated within non-RMMAs are not radioactively contaminated, while those generated within RMMAs are considered potentially contaminated. Potentially contaminated waste must either be further evaluated or managed as radioactively contaminated. The radiological evaluation is documented by means of a Property/Waste Release Evaluation form completed by both the waste generator and the Radiation Protection personnel.

This NRA Program document outlines the methodologies to determine a waste is not radioactively contaminated. It describes the practices and procedures used in the implementation of the Program. These procedures and practices provide specific instructions to the organizations involved and general guidance to the plantsite regarding radiological determinations. The procedures and practices include how to obtain a radiological evaluation, how RMMAs are determined, how radiological determinations are made, and how non-radioactive waste is shipped offsite.

II BACKGROUND

In May 1991, DOE, Headquarters imposed a moratorium throughout the DOE Complex to assure that RCRA-hazardous or TSCA-regulated wastes shipped from DOE facilities to commercial vendors have no bulk or volume radioactive contamination added as a result of DOE operations. The purpose of the moratorium was to prevent the inadvertent shipment of radioactive waste as non-radioactive to a commercial facility not licensed to accept radioactive waste. In November 1991, DOE, HQ issued the Performance Objective for Certification of Non-Radioactive Hazardous Waste to assist in the resolution of the waste shipping moratorium and outline the concept of Radioactive Materials Management Areas. An updated version of the draft Performance Objective was released April 1993 for review and comment.

The Performance Objective was issued to assist in the resolution of the RCRA/TSCA waste shipping moratorium. The Performance Objective was developed to establish and implement guidelines for distinguishing non-radioactive RCRA/TSCA waste for disposal. Its purpose is to assure that hazardous/toxic regulated wastes shipped from DOE facilities to commercial treatment, storage or disposal facilities have no bulk or volume radioactive contamination added as a result of DOE operations and are in compliance with DOE Order 5400.5 criteria for surface contamination unless the receiving facility is specifically licensed to manage radioactive waste.

The Performance Objective defines the term Radioactive Materials Management Area as an area in which the potential exists for radioactive contamination due to the presence of unencapsulated or unconfined radioactive material or an area that is exposed to beams or other sources of particles capable of causing activation. The Performance Objective also provides the appropriate methodology to determine the radiological status of waste material. These methods include process knowledge/history, radiological survey, and/or sampling and analysis.

The NRA Program has been designed to address and establish the principles of the Performance Objective at the RFP. The NRA Program uses all three methods for radiological determinations, either singly or in combination.

III PLANT DESCRIPTION

The RFP is a government-owned and contractor-operator facility. It is part of the nationwide nuclear weapons research, development and production complex administered by the DOE. EG&G is the primary contractor at the present time.

The plant was a key DOE facility in the production of nuclear weapons components since the early 1950s. The plant was involved in the fabrication of components from plutonium, uranium, beryllium and stainless steel. Past activities included metal fabrication and assembly, chemical recovery and purification of process-produced transuranic radionuclides, and related quality control functions. The primary radioisotopes of concern at RFP include Plutonium-239, Americium-241, depleted uranium (U-238) and enriched uranium (U-235).

As far as operations involving radioactive materials are concerned, the plantsite is divided into two major areas: plutonium and uranium operations.

The plutonium operations, located on the north side of the plant, (outlined in bold, see figure 1) include chemical processing, plutonium recovery, machining, assembly and laboratory analysis. In addition, the radioactive waste treatment facilities are included in the plutonium areas. Plutonium operations are performed within gloveboxes which are located within Radioactive Materials Management Areas. The Radioactive Materials Management Areas are located within the various plutonium facilities. There are 10 major buildings involved in these operations and a variety of support facilities.

The uranium areas, two areas located on the south side of the plant, (outlined in bold) include machining and forming facilities for depleted uranium. The area also includes the Criticality Mass Laboratory for enriched uranium and non-nuclear operations. There are approximately five major buildings involved with depleted uranium operations, one for enriched uranium operations and a variety of support facilities.

In addition to the above operations/facilities, there are a variety of administrative support facilities, an onsite medical facility, a radiological health facility, canteens, training centers, vehicle maintenance facilities, general maintenance shops and an onsite Sanitary Landfill. There are approximately 136 major structures on the plantsite.

The current mission of RFP involves the environmental restoration of the plantsite, the management of waste and nuclear materials, development of technology and completion of the remaining DOE non-nuclear production mission.

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Plant Map

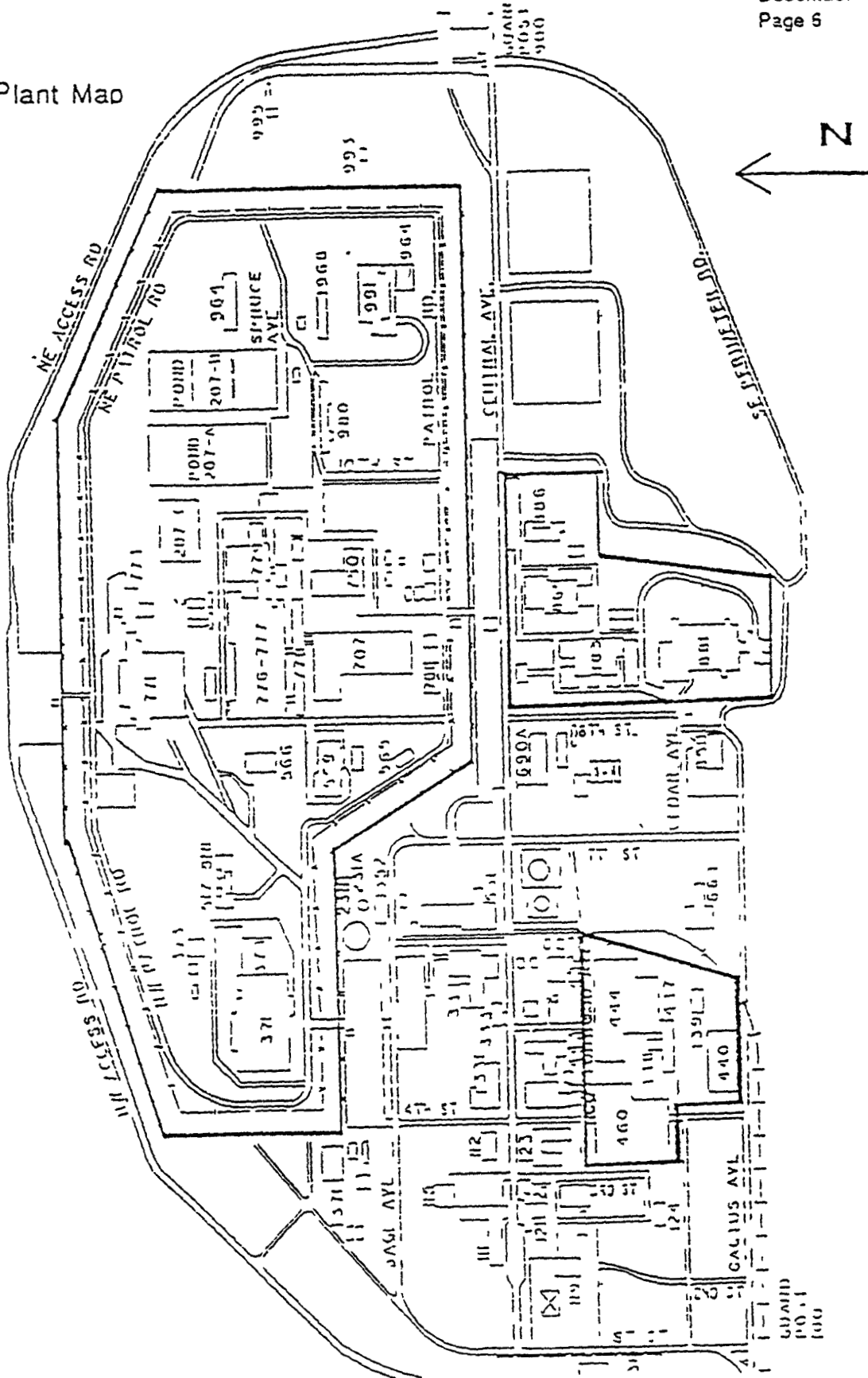


Figure 1

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IV PROGRAM OVERVIEW

A. INTRODUCTION

The purpose of the NRA Program is to provide a method to verify that no DOE controlled radioactive material has been added to a waste material. As most items have some inherent level of radioactivity, this Program does not determine whether or not waste is radioactive, but, instead, the possibility that DOE controlled radioactive material has been added due to a DOE activity. DOE controlled radioactive material at the RFP is typically Plutonium-239, Americium-241, and uranium (depleted and enriched).

Even though the waste shipping moratorium imposed by DOE, Headquarters was directed primarily at RCRA/TSCA regulated waste, the same release criteria and procedures apply to all waste generated throughout the Rocky Flats plantsite. Therefore, this Program document only outlines the methodologies to determine if a waste is potentially radioactively contaminated. Once the radiological status of the waste has been determined, the waste is then handled according to the appropriate waste management plan. Radioactively contaminated waste that is destined for offsite disposal is currently maintained within the DOE Complex.

Process/historical knowledge is the first and primary method used at RFP to determine if a waste is non-radioactive. It is simpler, less costly and far more efficient to determine the radiological status of a waste based on process/historical knowledge (e.g., point of generation). For example, a waste generated within known non-radioactive areas, or non-RMMAs, is determined to be non-radioactive by process/historical knowledge. The second method consists of radiological surveys and, if appropriate, sampling and analysis. If the results are below the established criteria, the waste is not radioactively contaminated.

The RMMA/non-RMMA designations are the key to determining, by process/historical knowledge, uncontaminated waste. An RMMA is an area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material or beams or other sources or particles capable of causing activation. At the RFP the potential for radioactive contamination is the primary concern. The Criticality Mass Laboratory, when it is conducting criticality experiments, is the only identified area that has the potential to cause activation. Radiological Engineering evaluates all areas of the plantsite and determines which are RMMAs and which are non-RMMAs.

The generator of the waste has a variety of information sources at their disposal to assist in determining if routinely generated waste is non-radioactive or radioactive based on point of generation. One information source is the Waste Stream and Residue Identification and Characterization (WSRIC) building books. Information describing the facility process operations, the process inputs and the output characterizations are incorporated into the WSRIC building books. Individual WSRIC books have been developed for each facility that generates waste and continues to be updated as part of ongoing waste management programs at RFP. The facility process descriptions, as well as the WSRIC study in general, provides a baseline categorization of the waste. The WSRIC books used in conjunction with RMMA/non-RMMA status provides guidance to the generator in the determination of non-radioactively

contaminated versus radioactively contaminated waste. Additional information sources include the Health and Safety Practices Manual and Radiological Protection personnel.

B ORGANIZATION

The Environmental and Waste Management (E&WM) and Safety, Safeguards and Security (SS&S) organizations are the principle organizations responsible for the establishment of the practices and procedures implementing the NRA Program. They are also responsible for Program oversight and provide overall guidance to the waste generator. The generator is responsible for assuring that waste is properly segregated, documented, characterized and managed. Figure 2 diagrams the organizational structure of the groups responsible for the establishment of the NRA Program and how they interface.

Within the E&WM organization there are several groups involved in the development and establishment of waste management programs: Waste Programs, Waste Operations and Analytical Laboratories. Waste Programs is responsible for the development of the various waste management plans for the plantsite and provide subject matter expert assistance in the development of the required procedures and training. Waste Programs has taken the lead in the development of the NRA Program. Waste Operations is responsible for coordinating shipments of non-radioactive waste offsite. The Analytical Laboratories are responsible for obtaining waste samples and for the analysis. Waste Operations may assist the Labs in collecting a waste sample.

Within the SS&S organization, Radiological Engineering and Radiological Operations have the primary responsibility for the radiological evaluations of buildings/areas and waste/property. The Radiological Operations personnel, known as Radiation Protection Technicians (RPT), perform surveys in accordance with DOE Order 5400.5, document the results and conduct the initial Property/Waste Release evaluation for the possible release of RMMA waste/property. Radiological Engineering is responsible for the development of the appropriate procedures and practices, in order to determine the radiological status of waste for both the Radiation Protection personnel and for the plantsite. They also provide the technical guidance to the Radiological Operations personnel and to the plantsite in the areas of radiological protection. In addition, they perform the RMMA and non-RMMA evaluations and complete the radiological evaluations deferred to them by Radiological Operations. Radiological Engineering also evaluates the waste prior to offsite shipment and verifies that it meets the offsite non-radioactively contaminated shipping criteria.

C PROCEDURES/PRACTICES

The following is a listing of procedures/practices by responsible organization. These procedures/practices are used to implement the NRA Program. The use of the procedures and practices are outlined in Section V, Program Description. The actual procedures and practices are listed in the attached appendixes.

E&WM

Waste Programs (WP)*

*WP-1027, Non-Radioactive Waste Packaging (Appendix B)

WO-1102, Waste/Residue Traveler Instructions (Appendix C)

Waste Operations (WO).

4-C19-OSS-001, Offsite Shipment of Non-Radioactive Waste
(Appendix D)

Analytical Laboratory (Labs):

L-6245-D, Sampling Procedure for Waste Characterization
(Appendix E)

L-6248-C, Operation of Tennenec LB4000 Gas Proportional Counter
(Appendix F)

L-6194-H, Preparation of Oils and Solvents for Analysis of Gross Alpha
and Gross Beta Activity (Appendix G)

L-6240-B, Sample Preparation for Analysis of Gross Alpha and Gross
Beta Activity in Aqueous Samples (Appendix H)

SS&S

Radiological Engineering (RE)

Health and Safety Practice 18 10, Release of Property/Waste for
Conditional and Unrestricted Use (Appendix I)

**REP-1003, Radiological Evaluation for Unrestricted Release of
Property/Waste (Appendix J)

**REP-1108, Radiological Evaluation of Areas, Rooms and Buildings
(Appendix K)

RE-0102, Procedure Training for Radiological Engineering Personnel
(Appendix L)

Radiological Operations (RO)

ROI 3 01, Performance of Surface Contamination Surveys (Appendix M)

**ROI 3 02, Survey Requirements For Conditional and Unrestricted Use
(Appendix N)

ROI 6 01, Performance Test and Operability Checks for Ludlum Models
12-1A and 31 Survey Instruments (Appendix O)

ROI 6 3, Performance Checking and Operation of Alpha Smear Counting
Instrumentation (Appendix P)

ROI 6 04, Performance Testing and Operation of the Eberline BC-4
Smear Counter (Appendix Q)

ROI 6 05, Use of the Bicorn Frisk-Tech with the A-100 and B-50
Detectors (Appendix R)

ROI 0 06, Procedure Training for Radiation Protection Personnel
(Appendix S)

* Procedures currently in development or revision

** Revised procedures currently in the review and approval cycle

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ROCKY FLATS INC.,
NRA ORGANIZATIONAL CHART

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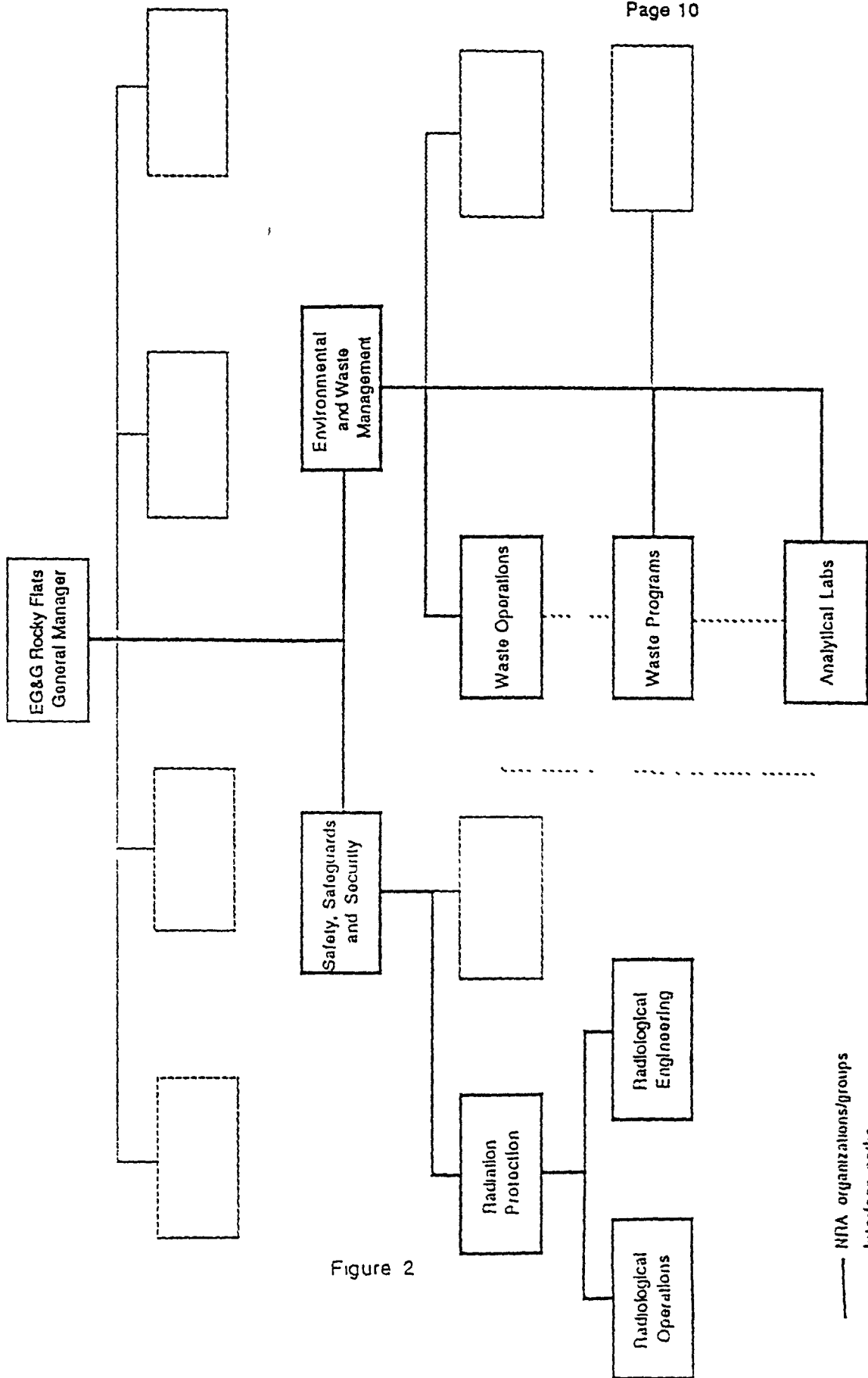


Figure 2

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V PROGRAM DESCRIPTION

The underlying operating principle of the NRA Program is process/historical knowledge, or point of generation. The determination of RMMA's is a fundamental part of the NRA Program. RMMA area evaluations are completed by Radiological Engineering in accordance with procedure REP-1108, Radiological Evaluation of Areas, Rooms and Buildings. An RMMA is an area in which the potential exists for radioactive contamination and the waste generated is managed as radioactively contaminated, until proven otherwise. Varying operating conditions, as identified through the Radiological Deficiency Report or the Occurrence Reporting System, may require an area to be designated as an RMMA due to non-routine maintenance operations, abnormal conditions or changes in a routine operation. These RMMA's shall be reclassified to non-RMMA's status once compliance with the criteria in REP-1108 has been achieved. Radiological Engineering maintains the active RMMA/non-RMMA files. An RCA/RMMA Determination form is completed for each area evaluation and logged in the RCA/RMMA Area Evaluation log. These records are maintained in accordance with the 1-77000-RM-001, Records Management Guidance for Records Sources.

Health and Safety Practice (HSP) section 18.10, Release of Property/Waste for Conditional and Unrestricted Use, is a level I document that provides instructions to the generator on how to release waste from either an RMMA or non-RMMA. It explains the use of the Material Transfer Tag, how to obtain a Property/Waste Release Evaluation (PRE) and provides building RMMA/non-RMMA status. If the generator has additional questions regarding the current radiological status of an area, Radiation Protection personnel are available to provide assistance.

Once the radiological status of the waste has been determined, the waste is packaged for offsite shipment in accordance with the appropriate packaging procedure. The waste generator is required, per the packaging procedure, to complete a Waste/Residue Traveler, regardless of the radiological status of the waste. The Traveler is completed in accordance with WO-1102, Waste/Residue Traveler Instructions. It is used as an in-process control document associated with the packaging of the waste. It includes information such as where the waste was generated, the radiological status, a description of the waste, a logsheet of the container contents, radiation protection information, a container tracking number, and additional information necessary for transportation. The Traveler stays with the container from the time the waste is generated until it is shipped offsite.

After a non-radioactive waste container has been packaged, Waste Operations then prepares the container for offsite shipment. The appropriate radiological records are assembled, as well as other required shipping records, in a Waste Shipment File. Prior to the shipment, Radiological Engineering signs a Due-Diligence for the Offsite Shipment of Non-Radioactive Waste. Waste Shipment Files are maintained in accordance with the established procedures and RFP plant policies.

Table 1 provides a matrix of the general operational steps, as detailed later in this section, the records generated during that step, the procedures/practices that pertain to those records, the group responsible for the procedure and the training involved to perform the operation.

TABLE 1
NO RADIOACTIVITY ADDED PROCEDURE MATRIX

OPERATION	GENERATED RECORDS	PROCEDURES/DOCUMENTS	RESP ORG	TRAINING
A NMMA evaluations	RCANMMA Determinations form	RE 1100	FE	FE
	RCANMMA Area Evaluation log	RE 1100	FE	FE
B Rad determinations				
1 non NMMA	Material Transfer Log	ISIP 10 10 NOI 3 02 FE 1003	Generator FO FE	*OJT NPT Qual FE
		RE 1003 NOI 3 01, 3 02, 6 01, 6 3, 6 04, 6 05	FE FO FO	FE NPT Qual NPT Qual
2 NMMA	Material Transfer Log	ISIP 10 10 NOI 3 02 FE 1003	Generator FO FE	OJT NPT Qual FE
		FE 1003 NOI 3 01, 3 02, 6 01, 6 3, 6 04, 6 05	FE FO FO	FE NPT Qual NPT Qual
	Property/Waste Release log	NOI 3 01, 3 02, 6 01, 6 3, 6 04, 6 05	FO FO	NPT Qual NPT Qual
		L-6240-C L-6194 H L-6245-D L-6240-B	Labs Labs Labs Labs	**p p **p p **p p **p p

TABLE 1 (cont'd)
 NO RADIOACTIVITY ADDED PROCEDURE MATRIX

OPERATION	GENERATED RECORDS	PROCEDURES/DOCUMENTS	RESP ORG	TRAINING
C Waste Packaging	Traveler	WP 1027 WO 1102	Generator Generator	Waste Gen Waste Gen
D Shipping Offsite	Shipping Coordinator Checklist	4-C19-OOS-001	WO	***UD
	Load List	4-C19-OOS 001	WO	***UD
	Material Transfer Tag	HSP 18 10 ROI 3 02 RE 1003	Generator RO FE	*OJT RPT Qual FE
	PRE	RE 1003 ROI 3 02	FE RO	FE RPT Qual
	Traveler	WO 1102 WP 1027	Generator Generator	Waste Gen Waste Gen
	Due Diligence for Non Radioactive Waste form	4 C19-OOS-001	WO/RE	***UD

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* OJT On the Job Training
 ** PP Progression Program
 ... UD Under Development

A. WASTE FROM NON-RMMAS

Wastes generated in non-RMMAs are, by definition, not radioactively contaminated. Examples of such areas include general office buildings, non-nuclear manufacturing operations, cafeterias, training centers, vehicle maintenance facilities, general maintenance shops, etc. Established physical and administrative controls for the non-RMMAs are sufficient to prevent the generation of radioactively contaminated waste in these areas.

Even though non-RMMA waste is by definition not radioactively contaminated, if the waste is destined for offsite treatment and/or disposal it undergoes a radiological evaluation and a PRE form is completed. In addition, non-routine municipal type waste (i.e., waste generated during demolition or construction activities) that is destined for the onsite Sanitary Landfill is also required to have a PRE completed. The PREs are completed by both the waste generator and Radiological Engineering. They provide the necessary documentation on the process/historical knowledge of the waste in question and detail any release surveys that may be required. In addition, a Material Transfer Tag is completed by the generator and Radiological Protection prior to the waste being sent to either the onsite Landfill or a waste storage area prior to offsite shipment. The PRE and Material Transfer Tag accompanies the waste from its point of origin until its disposal in the onsite Landfill or it is shipped offsite.

Routine municipal waste (i.e., office trash) being disposed of in the onsite Landfill is not required to have a PRE completed. A Material Transfer Tag is required, though Radiological Protection is not required to sign off on it. HSP 18.10 provides instructions on when only the Material Transfer Tag is required and what organization signs it.

Non-radioactive waste that is destined for offsite disposal, is packaged in accordance with WP-1027, Non-Radioactive Waste Packaging. The procedure provides instructions on segregating, packaging and completing the documentation for non-radioactive, RCRA or TSCA regulated wastes. A Traveler is completed as required per the packaging procedure. The Traveler accompanies the packaged waste from the point of generation until it is shipped offsite for disposal.

B. WASTE FROM RMMAS

RMMAs are those areas in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material or beams or other sources of particles capable of causing activation. Routine wastes generated in RMMAs are generally considered to be radioactively contaminated and managed as such. The generator, though, may request that a radiological waste evaluation be performed for non-routine waste. HSP 18.10 provides guidance to the generator on how to obtain a radiological evaluation.

Prior to removing material from an RMMA as non-radioactively contaminated, an RPT performs an initial release evaluation. If the material meets the deferral criteria outlined in ROI 3.02, the RPT will defer the release evaluation to Radiological Engineering. The deferral criteria includes volume or bulk materials, waste originating from areas not on the RMMA/non-

RMMA list, or waste that cannot be surveyed using the techniques outlined in ROI 3 02. If the material does not meet the deferral criteria, the RPT completes the release evaluation and performs the surface contamination surveys in accordance to ROI 3 02, Survey Requirements for Conditional and Unrestricted Use. The generator fills out the Material Transfer Tag and the RPT signs the 'Surveyed Property Release Approval' section.

If the release evaluation is deferred to Radiological Engineering, the RPT will notify the generator that Radiological Engineering assistance is required. The generator fills out Section I of the Property/Waste Release Evaluation (PRE) form and submits it to Radiological Engineering for review. Radiological Engineering evaluates the waste using process/historical knowledge and determines the survey and, if appropriate, sampling requirements in accordance to REP-1003, Radiological Evaluation for Unrestricted Release of Property/Waste. Radiological Engineering will detail, in Section II of the PRE, the surveys required to release the waste and, if appropriate, what samples to take.

Process/historical knowledge information includes origin of the waste, how the waste was generated and what radiological controls were in place during the waste generation. An example of using process/historical knowledge would be the evaluation of a sealed container located within an RMMA. If the container remained unopened while in the RMMA, the container may be released based on surface surveys alone. On the other hand, if there were indications that the container may have been opened while in the RMMA, sampling and analysis of the contents may be required in order to determine the waste was non-radioactively contaminated.

Currently, only homogeneous liquid wastes are sampled for compliance to radiological release criteria. Radiological Engineering reviews the waste to determine if sampling is applicable. If the waste is a homogeneous waste, such as oil, Radiological Engineering may recommend that a sample be obtained and analyzed. If the waste is non-homogeneous (i.e., clean-up material), process/historical knowledge is inadequate, and surface surveys are insufficient, the waste will be managed as radioactively contaminated.

If Radiological Engineering recommends bulk/volume sampling, a sample is collected per L-6245-D, Sampling Procedure for Waste Characterization. The sample is submitted to the Analytical Laboratories for gross alpha/beta analysis. Sample analyses are performed in accordance with the established laboratory procedures: L-6240-B, Sample Preparation for Analysis of Gross Alpha and Gross Beta Activity in Aqueous Samples, L-6194-H, Preparation of Oils and Solvents for Analysis of Gross Alpha and Gross Beta Activity and L-6248-C, Operation of Tennessean LB4000 Gas Proportional Counter.

The sample results are then compared to the minimum detectable activity (MDA) as established per the appropriate procedure: L-6194-H or L-6240-B. If the results are below the MDA, it is determined that no DOE radioactive material has been added to the waste and it can, therefore, be handled as non-radioactively contaminated. If the sample results are equal to or greater than the MDA, the waste is considered radioactive and handled as such. Radiological Engineering signs the PRE form and informs the generator of the results.

For non-radioactive waste generated in an RMMA that is destined for disposal, the completed

PRE must accompany the waste from the point of generation to the point it leaves the plantsite or is disposed of in the onsite Landfill

Waste that can not be verified as free of DOE radioactive contamination is packaged and managed in accordance with the appropriate radioactive waste management plan. At the current time, all radioactively contaminated waste generated at RFP is disposed of within the DOE Complex.

C WASTE FROM UNKNOWN/UNDETERMINED AREAS

There are some areas of the plantsite that have not yet been identified as RMMA's or non-RMMA's. If an area designation has not been made, the generator contacts Radiological Engineering for assistance prior to the waste being generated and shipped for disposal. Once the evaluation has been completed, the waste will be managed accordingly.

RFP currently has stored on plantsite hazardous waste that has been generated in the past. This waste has been stored due to a lack of approved guidelines to distinguish non-radioactive waste from radioactive waste. The radiological evaluations and the plan to dispose of these wastes are addressed in the Non-Radioactive Hazardous Waste Certification and Disposal Plan that is currently under development. The radiological evaluations for past generated waste will follow the same methodologies outlined in this Program document.

D OFFSITE SHIPMENT FOR TREATMENT/DISPOSAL

The Offsite Shipment of Non-Radioactive Waste procedure, 4-C19-OSS-001, is Waste Operations floor level procedure that provides instructions for the coordination and preparation of offsite shipments of non-radioactive, regulated and non-regulated waste destined for treatment and/or disposal. The generator contacts the Waste Operations group to inform them they have waste ready for transfer. Waste Operations receives the waste in storage areas and initiates preparation for offsite shipment. The Waste Operations Shipping Coordinator verifies that all the necessary records have been assembled and completed. If any records are missing or have not been completed or there are discrepancies in the records, the Shipping Coordinator negotiates a resolution, with the appropriate personnel, prior to continuing with shipment preparation. The Shipping Coordinator coordinates the offsite shipment with the Traffic Department and the offsite vendor. Waste Operations maintains all the associated records for each shipment in the Waste Shipment File.

The Waste Shipment File includes the Material Transfer Tag, Traveler, PRE forms, survey information and any other applicable radiological documentation. The Shipment File also includes waste characterization information, the Shipping Coordinator Checklist, and the Load List. In addition, a Due Diligence form for Offsite Shipment of Non-Radioactive Waste is signed by Radiological Engineering prior to each shipment offsite and is included in the Waste Shipment File.

The Waste Shipment Files are maintained by Waste Operations for a period of three years. The Shipment Files are then archived in accordance with 1-77000-RM-001, Records Management Guidance for Records Sources.

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Applicable RFP Procedures/Documents

REP 1108
WSRIC Building books

HSP 18 10

Note Waste generated within an RMMA defaults to radioactive status, until proven otherwise

ROI 3 02

ROI 3 02
REP 1003
HSP 18 10

REP 1003

REP 1003

ROI 3 02
ROI 3 01, 6 01, 6 3 6 04 6 05

Note If surveys exceed release criteria decontamination operations may be initiated if deemed appropriate, by Rad Protection personnel

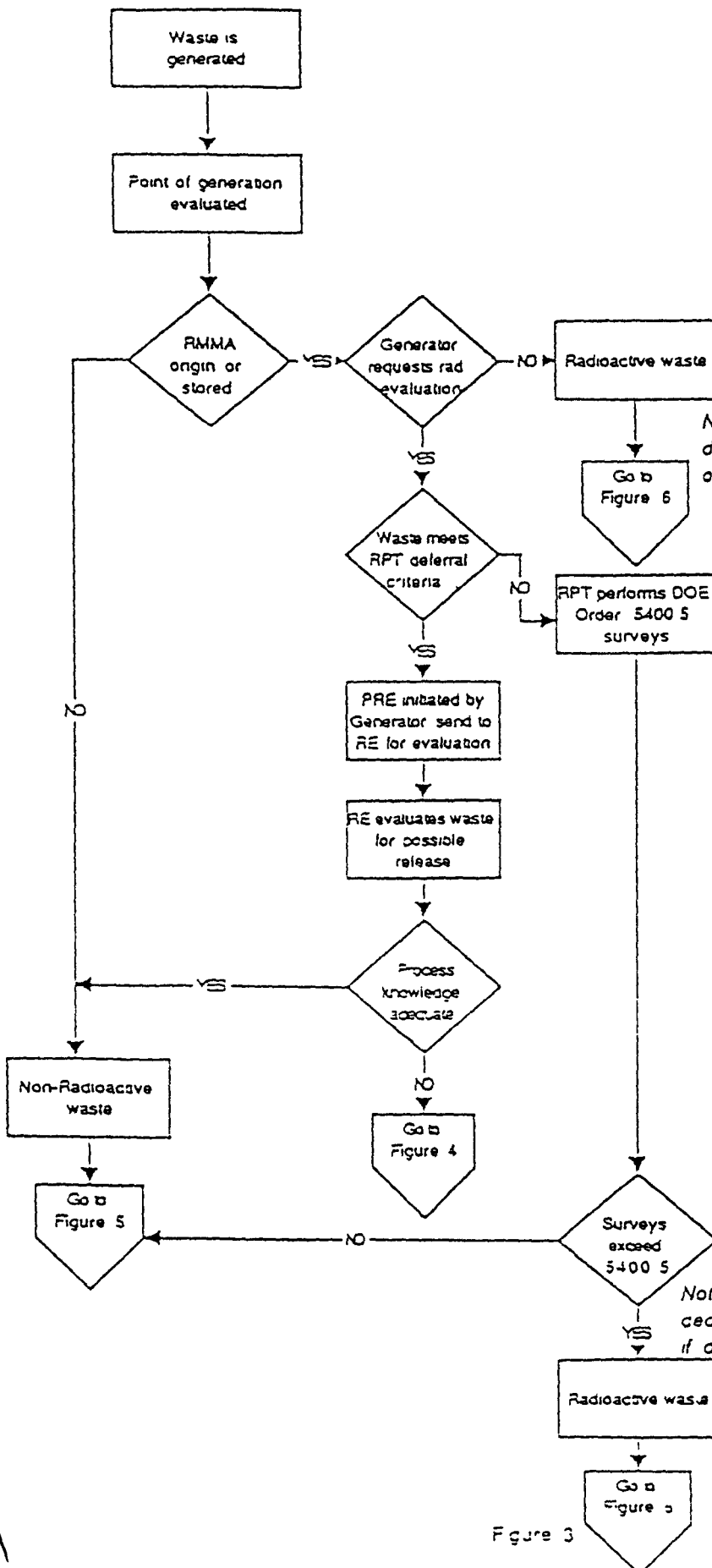
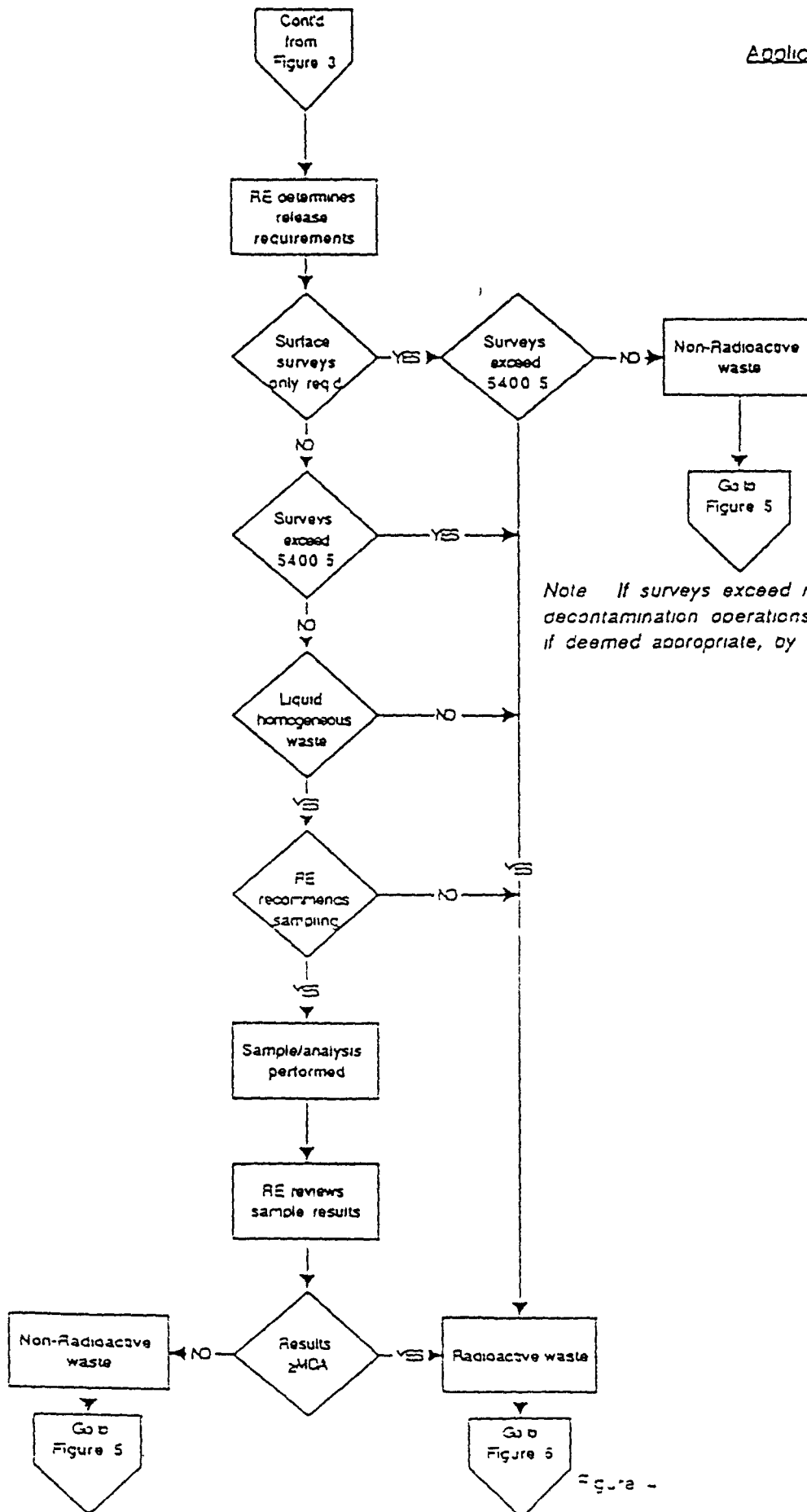


Figure 3

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Applicable RFP Procedures/Documents



RFP 1003

RFP 1003
ROI 3 02
ROI 3 01, 6 01, 6 3, 6 04, 6 05

Note If surveys exceed release criteria, decontamination operations may be initiated if deemed appropriate, by Rad Protection personnel

RFP 1003

RFP 003

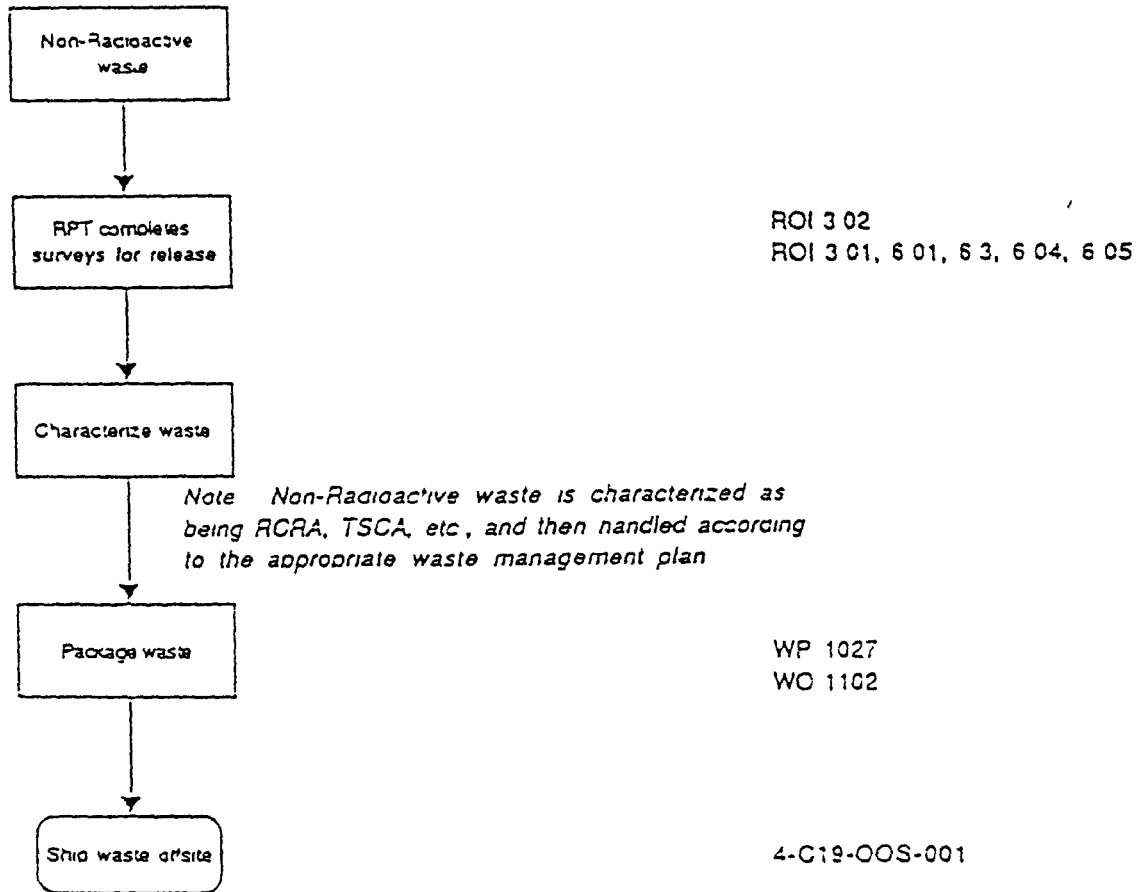
L 6245-D
L 6248-C
L-6194-H
L-6240-B

RFP 1003

RFP 1003
L-6194-H
L 6240-B

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Applicable REF Procedures/Documents



Radioactive waste



Characterize waste



Package waste



Prepare waste for
offsite shipment

Applicable RFP Procedures/Documents

The DOE moratorium deals only with the shipment of non-radioactive waste to commercial vendors, therefore radioactive waste packaging and shipping procedures are not listed

Note. Radioactive waste is characterized as being RCRA-mixed, etc., and handled according to the appropriate waste management plan

Note. Radioactive waste destined for offsite treatment/disposal currently remains within the DOE Complex.

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Figure 6

VI TRAINING

Waste Generator Training

Personnel responsible for the generation, handling, or packaging of waste at the Rocky Flats Plant must be qualified according to the requirements of the controlling program. There are two controlling programs - the Non-Radioactive Waste Program and the Solid Radioactive Waste Program. Each program establishes the requirements for the five parts of the qualification. The five parts composing the qualification standard package (QSP) are 1) basic training, 2) formal training, 3) theoretical knowledge verification, 4) on-the-job training, and 5) performance evaluation. The completion of each part of the qualification is documented on the Qualification Standard Package (QSP).

Part (2) or formal training is conducted in a classroom environment. It is in this part of the qualification, that waste generators are introduced to the methods of segregating waste according to radioactive versus non-radioactive. The Solid Radioactive Waste Program instructs employees to recognize radioactive waste according to one of two criteria: 1) it is generated in an RMMA, or 2) it is determined by non-destructive assay. The Non-Radioactive Waste Program instructs employees to recognize the point of generation as an RMMA or a non-RMMA. These concepts are then reinforced in part (4). Parts (3) and (5) are the testing standard that must be passed to qualify.

Radiation Protection Training

The Radiation Protection group is responsible for resolving radiological waste determination questions and issues. The RPT performs the smears and surveys and fills out the initial documentation. The Radiological Engineering staff evaluates areas for RMMAS/non-RMMAS status, reviews documentation completed by the RPT, evaluates waste for unconditional release and completes the necessary documentation to verify the waste is either non-radioactive or radioactive.

The RPTs are required to attend eight weeks of training in order to be a qualified RPT. The qualification course includes 6 weeks of classroom time and 2 weeks of on-the-job-training. In addition, ROI 006, Procedure Training for Radiation Protection Personnel, provides instructions for the training and documentation for the Radiation Protection personnel concerning new or revised ROIs. RE-0102, Procedure Training for Radiological Engineering Personnel, provides the requirements for training and the proper documentation for the Radiological Engineering staff concerning new or revised RE procedures.

In April 1993, the Rocky Flats Site Radiological Control Manual was established. The EG&G Rocky Flats Plant overriding policy on radiological protection is that radiation exposure to workers, the public and the environment and radioactive contamination levels will be kept as low as reasonably achievable (ALARA). The Radiological Control (RADCON) Manual establishes the fundamental requirements and procedures to meet this policy and commitment. It consists of the DOE Radiological Control Manual and clearly identified EG&G Corporate requirements.

The RADCON Manual outlines the training requirements for the Radiological Control Technicians (known as Radiation Protection Technologists at RFP) and for the Technical Support Personnel (Radiological Engineering). An initial assessment identified areas of non-compliance with the DOE Radiological Control Manual. Areas of non-compliance and the schedule to obtain compliance is included in the Rocky Flats Site Radiological Control Manual Implementation Plan issued April 1, 1993. The required upgrades to the Radiation Protection Training programs will be completed as outlined in the Implementation Plan and as funding is provided.

Waste Operations Training

Qualification Training for the Waste Operations personnel is currently under development. The Training will qualify personnel to perform the Offsite Shipment of Non-Radioactive Waste procedure. Currently, prior to the offsite shipment of non-radioactive, hazardous waste, Waste Operations management reviews all the associated paperwork and signs the Due-Diligence for Offsite Shipment of Hazardous Waste form. All of the paperwork is then transmitted to the Traffic Department for review for completeness and to initiate manifesting of the shipment.

Analytical Labs Training

The Analytical Laboratory Technician personnel are required to participate in a Progression Program. The Progression Program is made up of various modules that encompass all aspects of laboratory work. The Program takes a total of about 4 years to complete.

VII QUALITY ASSURANCE

The EG&G RFP Site Quality Assurance Manual is the comprehensive quality assurance plan to establish the requirements of DOE Order 5700 6C and NQA-1. The quality assurance plan that encompasses the waste management activities at RFP is 1-10000-EWQA Waste Management Quality Assurance Program Plan. This Plan covers all operations under the E&WM organization. Waste Programs, Waste Operations and Analytical Laboratories

Additional quality assurance plans are currently under development for the Non-Radioactive Hazardous Waste Certification and Disposal Plan. These quality assurance plans will cover additional characterizations (both radiological and RCRA) of past generated waste stored on plantsite and destined for offsite disposal at either a commercial vendor or within the DOE Complex.

The quality assurance plan contained in the Non-Radioactive Hazardous Waste Certification and Disposal Plan will govern activities associated with the NRA Program. Details specific to the NRA Program are contained throughout the text of this document and are identified in the matrix in Appendix T. Figure 7 illustrates the hierarchical relationship of other RFP QA documents to the NRA Program.

ROCKY FLATS ASSURANCE PROGRAM
DOCUMENTS HIERARCHY

December 13, 1993
Page 24

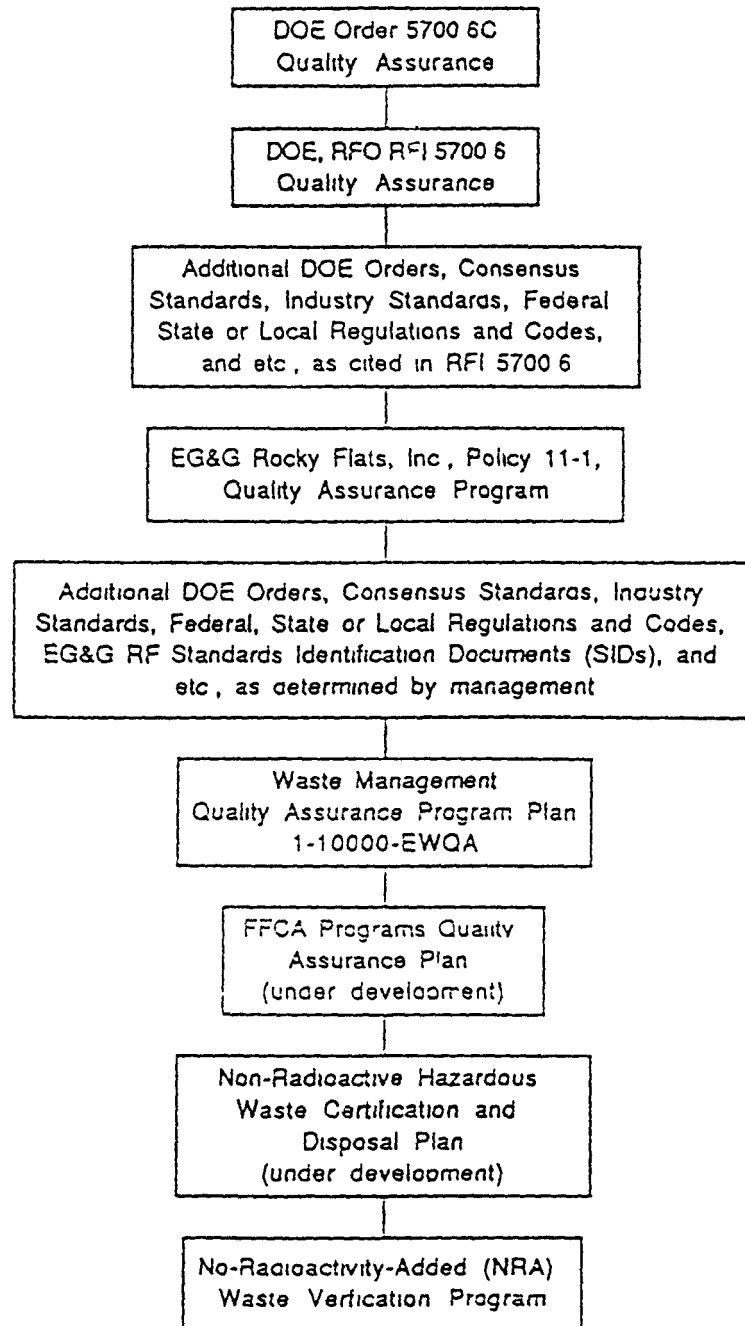


Figure 7

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INFORMAL NOTE

DATE. JAN 25 1995

TO: J. Lytle, EM-30

THRU: R. Blaney, EM-33

FROM: L. Stevens, EM-331

SUBJECT: Approval of the Moratorium Performance Objective

Included with this note is the "Performance Objective for Certification of Nonradioactive Hazardous Waste," Revision 1 for your approval. We are trying to get this revision approved and issued to the site in support of the effort to transfer authority for moratorium reviews/approval/audits to the Operations Offices.

Background

The moratorium was established in May 1991. In the weeks following the establishment of the moratorium, EM-331 prepared a draft "Performance Objective for the Certification of Non-radioactive Hazardous Waste." This draft Performance Objective (PO) was reviewed and discussed with DOE and contractor field personnel at the first complex-wide meeting on the moratorium (Dallas, June 1991). Subsequently, the results of the discussions at the meeting were incorporated into the PO and submitted to you for approval. Following consultation with EM-1, you approved the PO and it was sent to the Operations Offices.

Discussion

The PO has now been revised to improve clarity, add an appendix with guidance on establishing radioactive materials management areas (RMMAs) and to reflect the experience that has been gained over the course of the reviews. The revision was distributed to the Operations Offices and Headquarters program offices for review and comment. The comments have been reviewed, and where appropriate, the PO revised in response to the review comments.

The revised PO in its current form was discussed with Operations Office representatives at a complex-wide meeting on November 8-9, 1994, and no objections to it were raised. The main purpose of this meeting was to lay the foundation for delegating responsibility for moratorium reviews to the Operations Offices. The revised PO is one of a number of documents being provided to the Operations Offices to enable them to understand and exercise the responsibilities being delegated to them.

Recommendation

Approve the PO, Revision 1, so it will be available as a basis for the Operations Offices to take over the main responsibility for the moratorium.

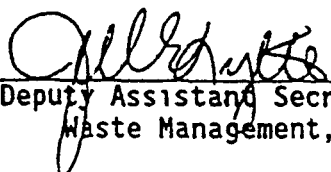
Attachment

PERFORMANCE OBJECTIVE
FOR
CERTIFICATION OF
NON-RADIOACTIVE HAZARDOUS WASTE

OFFICE OF ENVIRONMENTAL MANAGEMENT

OFFICE OF WASTE MANAGEMENT (EM-30)

Approved by:


Deputy Assistant Secretary for
Waste Management, EM-30

Date:

2/17/93

PERFORMANCE OBJECTIVE
FOR
CERTIFICATION OF
NON-RADIOACTIVE HAZARDOUS WASTE

PERFORMANCE OBJECTIVE: To assure that RCRA-hazardous, state-hazardous and TSCA-regulated wastes shipped from DOE facilities to commercial treatment, storage or disposal facilities have no bulk or volume radioactive contamination added as a result of DOE operations and are in compliance with DOE Order 5400.5 criteria for surface contamination unless the receiving facility is specifically licensed to manage radioactive waste.

1.0 Purpose

The Performance Objective contained herein is to provide interim requirements for determining whether a Resource Conservation and Recovery Act (RCRA)-hazardous, state-hazardous or Toxic Substances Control Act (TSCA)-regulated waste is radioactive. These interim requirements are predicated on Department of Energy (DOE) activities adding no measurable radioactivity, within statistical limits, in bulk to a material which is being declared a waste and meeting the DOE Order 5400.5 surface contamination guidelines. This determination is necessary before a waste can be transported offsite for treatment or disposal at non-DOE owned facilities not licensed for management of radioactive materials.

The Department is actively working on limits for levels of radioactivity that can be safely released for treatment or disposal. This Performance Objective is to remain in effect until the Department, in coordination with other federal agencies, establishes risk-based numerical limits for release of waste. Once established, implementation of numerical limits will be subject to individual state regulations.

2.0 Background

Misapplication of DOE Order requirements regarding processes for acquiring approval of release criteria and the absence of a Federally-established "de minimis" level of radioactivity in wastes have resulted in the use of inconsistent criteria and methods for making decisions on the release of waste from DOE sites. Sites have individually established release criteria based on the inappropriate application of standards found in DOE Orders, Department of Transportation (DOT) regulations, Nuclear Regulatory Commission (NRC) regulations and guidance, or a combination thereof. The lack of clear guidance has created a situation in which slightly radioactive waste could be released to treatment or disposal facilities which are not licensed for management of radioactive materials. As a result, the Office of

4.0 Definitions

A review of the definitions in the above-referenced Orders resulted in the conclusion that new or improved definitions were needed to cover the unrestricted release of RCRA-hazardous, state-hazardous and TSCA-regulated waste to commercial TSDs. Therefore, to facilitate implementation of this Performance Objective, new or revised definitions are provided in the following sections.

- 4.1 **Radioactive Waste:** A radioactive waste is any waste managed for its radioactive content which is not otherwise regulated for that radioactive content (e.g., regulated by Clean Air Act, etc.). If a material was received as nonradioactive, any resulting waste is not a radioactive waste if it meets the following conditions:
1. Contains no measurable increase in radioactivity (at a statistically defined confidence interval) above background in volume or bulk resulting from DOE Operations except for wastes specifically exempted or excepted by the Environmental Protection Agency (EPA), DOE, or NRC regulations (e.g., 10 CFR 20.2005); and
 2. Complies with the surface contamination requirements established in DOE Order 5400.5, 11.5.c.(1).
- 4.2 **Mixed Waste -** Mixed waste is radioactive waste which is also regulated under Subtitle C of RCRA. Note: Radioactive state-hazardous and TSCA-regulated waste, although not technically mixed waste, is also subject to the requirements specified in this Performance Objective.
- 4.3 **Radioactive Materials Management Area -** A Radioactive Materials Management Area (RMMA) is an area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material or an area that is exposed to beams or other sources of particles (neutrons, protons, etc.) capable of causing activation. Accident or variant conditions may require areas to be designated as temporary RMMAs until conditions are corrected. The delineation of RMMAs is a complex technical process which is central to the management of waste at DOE facilities where radioactive materials are present. Detailed guidance is provided in Attachment A of this Performance Objective.
- 4.4 **Unrestricted Release -** Unrestricted release is the release of property (e.g., waste), based on a formal, documented decision that the property may be utilized, treated, or disposed of by any party without concern for radioactive content.

5.0 Basic Principles

The definition for mixed waste provided above is consistent with the intent of the definition in DOE Order 5820.2A. Similarly, the definition of radioactive waste provided above is also consistent with the intent of the definitions in DOE Order 5820.2A. There are no generic "below regulatory concern" or "de minimis" tests for defining radioactive material.

Therefore, the basic principle effected by this Performance Objective is that no mixed waste, as defined above, is to be shipped offsite to a facility not specifically licensed for the receipt of the radioactive component of the waste.

When a waste is potentially a mixed waste, there are three possible cases for disposition:

- Case 1 the waste is determined to be a hazardous waste only and is shipped offsite for treatment and disposal; and
- Case 2 the waste is determined to be a mixed waste and is managed, treated, and disposed of at DOE facilities; and
- Case 3 the waste is determined to be a mixed waste and is shipped to NRC or Agreement State-licensed, RCRA-permitted offsite commercial facility for treatment, then the radioactive residue is disposed of in a licensed (and permitted, if required) commercial disposal facility or returned to DOE for treatment/disposal.

Note: All mixed waste is radioactive waste by definition. DOE Order 5820 2A specifies the management and disposal of all radioactive waste: high-level waste is to be stored, treated, then disposed of in the National Repository; defense transuranic waste is to be disposed of at the Waste Isolation Pilot Plant; and low-level waste (the main concern of this Performance Objective) is to be disposed of "... on the site where it is generated, if practical, or if on-site disposal capability is not available, at another DOE disposal facility."

Thus for the first case, the certification that no radioactive waste is present is all that is necessary. Further management is defined by the regulations of RCRA. The criteria and procedures for declaring that a waste is not radioactive are the principles focused on in this Performance Objective

For the second case, a determination that the waste is a mixed waste is all that is necessary. Subsequent management is defined by the referenced Orders and regulations. Mixed waste managed on-site or at another DOE facility is not discussed any further in this Performance Objective

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For the third case, shipment of mixed waste to an NRC or Agreement State-licensed, RCRA-permitted, offsite commercial treatment/disposal facility does not constitute unrestricted release. Compliance with requirements in existing Orders (Order 5820.2A) and applicable state regulations is necessary. Formal verification of the permit and license status of the receiving facility must be documented and clearly traceable to the waste shipment.

Basically, the site shall have formal documented procedures addressing the decisions and management of waste via the three cases summarized above. However, the emphasis of this Performance Objective is on the first and third cases for DOE-regulated materials.

6.0 Determining Radioactivity Status of Wastes

A site's criteria and procedures for demonstrating compliance with this Performance Objective must be aimed at determining if there is a measurable increase in radioactivity above background from DOE operations. This may be done by either process knowledge, surface contamination surveys, or sampling and analysis (radioassay), or by a combination of these techniques. The method(s) used is dependent on the source of waste, type of waste (e.g., solid or liquid) and the nuclides potentially present.

6.1 Radioactive Materials Management Area - A key aspect to management of potentially radioactive waste is the establishment of radioactive materials management areas (RMMAs) as defined in this Performance Objective. Operating procedures must specify the identification of the physical boundaries of areas qualifying as RMMAs. Any waste streams exiting an RMMA would be considered to be potentially contaminated.

The boundaries of an RMMA may coincide with the site's Controlled Areas as defined in DOE Order 5480.11 or with Radiological Buffer Areas as defined in the "Radiological Control Manual." It is important to note that no decision regarding potential for contamination may be based solely on the waste coming from outside a radiological area as defined by DOE Order 5480.11. Because the definition of a radiological area is based on threshold values for dose, air concentration, or surface contamination level, it is not appropriate for making decisions which involve no threshold levels of contamination (i.e., the DOE 5400.5 definition of "Potential for Contamination" and the definition of an RMMA).

Radiological Areas, as defined in DOE Order 5480.11 may be, but are not necessarily, RMMAs. For example, a radiological area established because of the dose rate, but with no potential for contamination may not have to be an RMMA.

The delineation of RMMAs is a complex technical process which is central to the management of waste at DOE facilities where radioactive materials are present. Detailed guidance is provided in Attachment A of this Performance Objective

- 6.2 Process Knowledge - An understanding of the process generating a waste and the subsequent management of the waste may be used alone or in conjunction with another method in determining whether a waste is a radioactive waste.

If a waste is known to be from outside of a RMMA, the waste can be classified as non-radioactive. If a waste comes from inside an established RMMA, process knowledge may still be used in determining that the waste is non-radioactive. An example would be a sealed container of material which was never opened while in an RMMA and was not exposed to a source of activation. In this example, process knowledge can be used to certify that the waste is not contaminated in volume, and the waste can be released as non-radioactive if the container meets the surface release criteria contained in DOE Order 5400.5.

Procedures shall specify that the decision, and the rationale for the decision, that a waste is or is not potentially radioactively contaminated must be documented, certified, and in a readily retrievable form traceable to the waste container. For potentially contaminated wastes, process knowledge-based determinations of "radioactively contaminated" or "not radioactively contaminated" shall be similarly documented and certified. These certifications shall be made by individuals qualified by training and or cognizant of the origin, use, and potential for exposure of the waste in question. Each certification shall be traceable to the documented rationale for the decision that no radioactive waste is present.

Waste from inside RMMA's, which cannot be definitively declared radioactive or non-radioactive by process knowledge, must be considered potentially contaminated. The radioactive status must be established by appropriate survey and/or sampling and analysis. Process knowledge may be useful in limiting the range of radionuclides for which one must survey or analyze.

- 6.3 Surface Contamination Surveys - Use of surface contamination surveys must be limited to making decisions regarding the surface contamination of a material; generally, surface contamination surveys are not appropriate for making decisions on the absence of radioactive materials in waste that is potentially volume contaminated. Assessment of surface contamination must include a sufficient number of survey points to characterize the radiological condition of the surface of the waste, container, or both.

Surface contamination surveys, and the appropriate ALARA analyses, may be used for determining compliance with the surface contamination guidelines of DOE Order 5400.5, Figure IV-1. The guidelines in Figure IV-1 are augmented by the following:

Allowable Total Residual Surface Contamination
(dpm/100 cm²)

<u>Radionuclides</u>	<u>Average</u>	<u>Maximum</u>	<u>Removable</u>
Transuranics, I-125, I-129, Ra-226, Ra-228, Th-228, Th-230, Ac-227, Pa-231	100	300	20

Reference: Memorandum; J.R. Maher to J.R. Beers, et al., "Unrestricted Release of Radioactively Contaminated Personal Property," dated May 15, 1984

The process for conducting the surveys, and for documenting the results shall be specified in formal, documented procedures which include:

- survey procedures, survey instruments, survey parameters, survey techniques;
- criteria for determination of surface contamination;
- instrument detection sensitivity, detection limits for nuclides of concern and calibration requirements; and
- procedures for determining background and adjusting survey data accordingly.

All procedures shall be appropriate for the radionuclides and matrices to be analyzed. The radionuclides of concern shall be part of the decision process for selecting the appropriate detection techniques and instruments.

Survey techniques and instrumentation shall be representative of up-to-date technologies. Extraordinary techniques, such as counting samples in a radiation detector for unreasonably extended periods, are not required, as long as appropriate and necessary detection limits are achieved.

If individual items determined to be acceptable for release in accordance with the criteria for surface contamination in DOE Order 5400.5 are composited in a container, the container will not be considered to be bulk contaminated.

Radiation survey results shall be recorded as prescribed in the "Radiological Control Manual," DOE/EH-0256T, Rev. 1. A certification that no radioactive waste is present shall be provided and documented similar to that described for process knowledge-based decisions and shall reference and be traceable from the waste shipment to the

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survey/analytical data. All data supporting a determination that a waste is not a radioactive waste shall be documented in a readily retrievable form.

6.4 Sampling and Analysis - When a reasonable potential for volume contamination of the waste exists, and cannot be adequately resolved by process knowledge, certification of the absence of radioactive contamination must be based on radiological survey and/or sampling and analytical data. The process for conducting sampling and analysis, and for documenting the results shall be specified in formal documented procedures which include:

- guidelines for developing sampling criteria and procedures;
- statistical basis for sample frequency, definition of allowable error and specification of confidence interval;
- instrument detection sensitivity, detection limits for nuclides of concern and calibration requirements;
- procedures for determining background (including naturally occurring radioactive material) and adjusting radioassay data accordingly; and
- description and justification for the criteria (L_c or L_o) used for determining if DOE radioactivity has been added to the volume of waste.

All procedures shall be appropriate for the radionuclides and matrices to be analyzed. The radionuclides of concern shall be part of the decision process for selecting the appropriate detection techniques and instruments. Radioassay techniques can be used for determining a waste is not radioactive only if they can be reasonably expected to distinguish DOE-added radioactivity from radioactivity in a virgin sample of the material being assayed.

Radioassay techniques and instrumentation shall be representative of reasonably available, up-to-date technologies. Extraordinary techniques, such as counting samples in a radiation detector for unreasonably extended periods, are not required, as long as appropriate and necessary detection limits are achieved.

Examples of acceptable methods for demonstrating that no radioactivity has been added and, therefore, a waste is not a radioactive waste, include.

- comparing analytical results for the potentially radioactive waste to results for the same or comparable material as it is received by the site;

- for potentially radioactive soils, comparing analytical results for the suspect soil to analytical results of native soils from areas outside of RMMAs,
- comparing analytical results to a background measurement with no sample present.

In all cases, the sampling and analyses should be based on accepted practices (accepted practices include, but are not limited to, the following: SW-846, "Test Method for the Evaluation of Solid Waste, Physical/Chemical Methods"; those listed in Appendix D of the DOE Survey Manual; EPA's Environmental Monitoring Systems Laboratory (EMSL), Las Vegas, Nevada; DOE's Environmental Measurements Laboratory (EML), Long Island, New York; EPA's Eastern Environmental Radiation Facility (EERF) Radiochemistry Procedures Manual guidance; and the Environmental Radiation Ambient Monitoring System (ERAM) Manual). Valid statistical methods providing a defined confidence level should be employed.

A certification that no radioactive waste is present shall be provided and documented similar to that described for process knowledge-based decisions and shall reference and be traceable from the waste shipment to the analytical data. All data supporting a determination that a waste is not a radioactive waste shall be documented in a readily retrievable form.

7.0 Shipment of Mixed Waste to a Licensee

In accordance with the policy in DOE Order 5820.2A, radioactive and mixed wastes are to be disposed of at a DOE site. Any exceptions to this requirement must be approved in accordance with the exemption paragraph of the Order.

Two scenarios are possible with respect to shipment of mixed waste. In the first scenario, waste may be shipped for treatment if the receiving facility holds the required RCRA permits and an NRC or Agreement State license for the radionuclides being shipped. In this case, the residue resulting from the treatment must be returned to a DOE site for disposal. In the second scenario, a site may obtain an exemption from Order 5820.2A requirements and ship a mixed waste for treatment and/or disposal at a TSD facility holding the requisite RCRA permit and NRC or state radioactive materials license.

Neither of the above scenarios constitutes unrestricted release of radioactive materials. The radioactivity remains either under the control of DOE or is being managed under the provisions of an NRC or state radioactive materials license.

The site shall have formal procedures, as necessary, to address the two scenarios. A formal policy or procedure must be in place to address the management of radioactivity in mixed wastes sent off site.

Site procedures shall require confirmation that the receiving TSD facility is licensed for the radionuclides being transferred and contain a formal checkpoint at which a qualified and cognizant individual certifies that a radioactive waste is going to a facility with the appropriate radioactive materials license(s). The certification shall be documented. Records traceable to the shipment must be maintained showing that the certification was made and that the waste meets the TSD's acceptance criteria. For example, some TSDs have established radioactivity limits relative to the local background for acceptance of waste.

8.0 Department of Transportation Shipping Requirements

The site shall have formal procedures invoking the DOT regulations governing shipment of radioactive materials.

9.0 Quality Assurance

The site's formal documented procedures for waste management and characterization (survey, sampling and analysis, and instrument calibration, packaging, storage, and shipping, etc.), shall be covered by approved quality assurance plans meeting the requirements of 10 CFR 830.120, DOE Order 5700.6C and ASME NQA-1, as appropriate. Attachment B, "QA Review Areas," provides general guidelines for evaluating the adequacy of the quality assurance provisions to meet this PQ.

10.0 Training

In addressing the requirements of this Performance Objective, Performance Based Training (PBT) must be provided to those personnel performing waste radioactivity determinations. PBT is training based on an analysis of the job to be performed. The training must cover the procedures that are implemented when deciding and documenting that a waste is or is not radioactive. The training program shall include a method for evaluating the effectiveness of the training (e.g., testing, job performance evaluations). For personnel involved in radiation surveys, training specified in the "Radiological Control Manual," (DOE/EH-0256T, Rev. 1) is adequate for meeting the training requirements of this Performance Objective. [CAUTION: it should be noted that criteria for unrestricted release of material are not addressed in DOE/EH-0256T, Rev. 1. The appropriate criteria are listed in DOE Order 5400.5 and this Performance Objective.] Training records shall be readily retrievable and periodic retraining shall be required.

11.0 Records

All records generated through procedures required by this Performance Objective shall be maintained as quality assurance records until record retention requirements can be incorporated into DOE Order 1324.2A, Records Disposition.

12.0 Review and Approval of Criteria and Procedures

Each DOE contractor shall establish waste certification criteria and procedures covering the release of RCRA-hazardous, state-hazardous and TSCA-regulated wastes generated, stored, or managed by all facilities and projects under their responsibility, including those managed by subcontractors. These criteria and procedures shall be reviewed and approved by cognizant line management. Authority and responsibility for review and approval shall be clearly established and documented and shall be traceable to the relevant criteria and procedures. The DOE Operations Office* shall review the contractor criteria and procedures for acceptance in meeting this Performance Objective.

The contractor line management review and approval, and the DOE field office acceptance, of the criteria and procedures need not occur before transmitting the criteria and procedures to EM for review. However, a commitment for the contractor to approve, and for the DOE field office to accept, the procedures before waste shipments resume will be a condition for lifting the moratorium. After the moratorium is lifted, changes to the waste certification criteria or procedures which affect compliance with this Performance Objective must be similarly reviewed and approved by the contractor, and reviewed and accepted by the DOE field office.

* As used above the term Operations Office includes other field offices that report to Headquarters (e.g., Rocky Flats).

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GUIDANCE TO FACILITIES ON CLASSIFICATION OF RADIOACTIVE MATERIALS MANAGEMENT AREAS (RMMAs)

Background

One of the basic requirements of the EM-30 Performance Objective (PO) for Certification of Non-Radioactive Hazardous Waste is the classification of Radioactive Materials Management Areas (RMMAs) from which all hazardous waste is considered potentially radioactive. A RMMA is defined as:

"an area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material or an area that is exposed to beams or other sources of particles (neutrons, protons, etc.) capable of causing activation."

The intent of this definition is to ensure that any area in which hazardous waste could potentially become radioactive is classified as a RMMA; all waste originating, used or stored in a RMMA must be certified through process knowledge, surveying, and/or sampling and analysis that it is not contaminated before it can be released offsite. The PO defined "contaminated" as surface contamination exceeding DOE Order 5400.5 limits, or DOE-added volume contamination that was measurable above background. Hazardous waste originating outside a RMMA can be released offsite based solely on its origin outside a RMMA.

- Despite the straightforward definition of a RMMA, our continuing review of facility procedures and discussions with facility personnel indicate that some facilities have experienced difficulty in establishing RMMAs consistent with the PO definition. This is of immediate concern because sites are currently permitted to ship hazardous waste off-site from areas not classified as RMMAs, even at sites where the moratorium is still in effect and the procedures for establishing RMMAs have not been reviewed and approved. Additionally, at least one facility has been found to have released hazardous waste containing measurable radioactivity offsite, even though the waste originated in areas not classified as RMMAs by the facility. This indicates that RMMAs are not always being established adequately.

- To review, hazardous waste used, generated or stored in RMMAs are prohibited from being shipped off-site to TSDs not licensed to handle the radioactivity unless 1) procedures have been approved and the moratorium has been lifted in accordance with the PO, or 2) a specific exemption has been formally requested and has been approved by DOE. Hazardous waste from non-RMMAs is not subject to the moratorium. However, even though formal DOE approval of the site RMMA classifications has not been required to permit shipment of waste from non-RMMAs, sites should review their classification approach to ensure that the classifications are consistent with this guidance. These classifications will be reviewed by DOE during site visits as part of a comprehensive review of the implementation of site procedures for releasing hazardous waste off-site in accordance with the PO

Guidance

Any area which is known to be radioactively contaminated, is potentially contaminated, or could become contaminated, should be classified as a RMMA unless 1) adequate controls are in place to prevent or detect inadvertent contamination and 2) the potential or existing contamination levels cannot cause detectable levels of radioactivity (above background) in waste generated in the area. Thus, all hazardous waste originating outside a RMMA and remaining outside an RMMA has no potential of becoming contaminated to detectable (above background) levels while it is within the boundaries of a DOE facility. The following guidance clarifies issues surrounding the establishment of RMMA's.

Relationship Between RMMA's and Other Area Designations

DOE Order 5480.11 defines a Controlled Area as "any area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials." To avoid conflict with security designations, related terms such as "Radiologically Controlled Areas" are used at some facilities. A facility may choose to define the boundaries of RMMA's similar to the boundaries of the Controlled Areas because Controlled Areas should encompass all areas where there is a potential for radioactive contamination. However, at some facilities the Controlled Areas encompass a significantly greater area than those areas where there is a potential for contamination. At these facilities, it may be appropriate to establish RMMA's having smaller areas than the surrounding Controlled Areas.

DOE 5480.11 defines a Radiological Area as any area with dose rates exceeding 5 mrem per hour, airborne radioactive concentrations exceeding 10% of tabulated (Table 1) values, or surface contamination levels exceeding tabulated (Attachment 2) values. As now defined by the PO, a RMMA is any area in which a reasonable potential exists for contamination of waste streams exiting the area. Based on this definition and the guidance presented later in this document, it may not be appropriate to define only those areas within Radiological Areas as RMMA's because Radiological Areas are defined based on threshold values. By definition, Radiological Areas encompass Radiation Areas, Airborne Radioactivity Areas and Contamination Areas.

Because the DOE Radiological Control (RadCon) Manual has recently been published, it is appropriate to evaluate the adequacy of the RadCon Manual area definitions for designating RMMA's. The RadCon Manual specifies criteria for posting Radiation, Airborne Radioactivity, and Contamination Areas, and variants of these areas (e.g., High Radiation Area, Fixed Contamination Area, etc.). In general, the criteria for posting Contamination Areas and Airborne Radioactivity Areas (which are the two areas most relevant to RMMA's) are the same as the criteria established in DOE 5480.11.

An important difference between DOE 5480.11 and the RadCon Manual is the establishment by the RadCon Manual of Radiological Buffer Areas. A Radiological Buffer Area is defined as "an intermediate area established to prevent the spread of radioactive contamination and to protect personnel from radiation exposure. The area surrounds or is contiguous with Contamination

Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiation Areas or High Radiation Areas." Briefly, Radiological Buffer Areas are to be established within the Controlled Area and are designed to provide a second boundary to minimize the spread of contamination.

Based on the revised definition of RMMAs and the guidance provided elsewhere in this document, subject to certain conditions, an area does not need to be defined as an RMA if surface contamination levels do not exceed and do not have a reasonable potential to exceed DOE 5400.5 (Figure IV-1) criteria for unrestricted releases of materials¹, and if airborne radioactivity levels do not exceed and do not have a reasonable potential to exceed RadCon Manual (Table 2-4) criteria for posting airborne radioactivity areas. There is a slight conflict between this guidance and the RadCon Manual area designations for Contamination Areas. Specifically:

- The RadCon Manual prescribes a criterion for fixed plus removable surface contamination by transuranic (and other selected) radionuclides that is 5 times higher than the DOE release criterion² (500 dpm/100 cm² vs. 100 dpm/100 cm²).
- The RadCon Manual contains a criterion specifically for tritium (10,000 dpm/100 cm²). DOE 5400.5 does not contain a tritium-specific criterion; the relevant criterion is that prescribed for beta-gamma emitters (1000 dpm/100 cm² for removable contamination).

Therefore, the RadCon Manual criteria are somewhat less restrictive in two specific cases than are the DOE 5400.5 criteria (except for those cases described above, the criteria are comparable). This indicates that it would be inappropriate to allow RMMAs to be defined only for those areas designated as Contamination Areas or Airborne Radioactivity Areas, because waste leaving areas not required to be defined as Contamination Areas in accordance with RadCon Manual criteria could be contaminated to surface contamination levels greater than DOE 5400.5 criteria. However, if Radiological Buffer Areas are required to be RMMAs, then this inconsistency becomes less critical because a Radiological Buffer Area is a second boundary designed to minimize the spread of contamination. It follows that Radiological Buffer Areas, if managed properly, are not likely to be contaminated to levels exceeding DOE 5400.5 criteria for surface contamination.

Based on this assessment, RMMAs may be designated to include Radiological Buffer Areas and all associated Contamination Areas, High Contamination Areas and Airborne Radioactivity Areas, subject to the following considerations:

¹ DOE 5400.5 surface contamination criteria are applicable to RMMAs because the criteria pertain to release of materials to uncontrolled areas, RadCon Manual surface contamination criteria pertain only to area designations and release of materials to controlled areas. The RadCon Manual refers to the DOE 5400.5 criteria for releasing materials to uncontrolled areas.

² DOE 5400.5 does not specify values for these radionuclides. Based on the March 15, 1984 letter by J. R. Maher titled "Unrestricted Release of Radioactively Contaminated Personal Property," the appropriate values for these radionuclides are the values listed in the Nuclear Regulatory Commission Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors."

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- Radiological Buffer Areas surrounding or contiguous only with Radiation Areas, High Radiation Areas or Very High Radiation Areas need not be considered RMMAs. Similarly, a particle beam of sufficiently low energy as to not be capable of activating waste need not be a RMMA.
- Inactive or secured Contamination Areas that are not designated Radiological Buffer Areas as allowed by the RadCon Manual should be designated RMMAs if there is a potential for contamination of waste generated in these areas, consistent with the PO and this guidance document.
- Designation of RMMAs in accordance with these criteria depends on 1) proper radiological surveys and 2) demonstration and documentation that waste generated in areas with known or potential surface or airborne contamination but not meeting the criteria for designation of RMMAs will not be reasonably expected to become contaminated. This caveat is discussed in more detail on page A-5, Areas that May Contain Incidental Levels of Loose Surface Contamination.

Determination of Contamination or Potential for Contamination

One of the primary difficulties in establishing RMMAs is determining whether a reasonable potential exists for contamination consistent with the PO. In some cases, the potential may exist but be extremely low; in other cases the potential levels of contamination may be extremely low; in still other cases there may be no potential unless there is a breakdown in physical and/or administrative controls. These and other potentially enigmatic situations are discussed below.

Areas Adjacent to Obvious RMMAs

Areas where unencapsulated radioactive materials are used or stored, or where activation may occur due to particle beams, clearly must be designated as RMMAs in accordance with the PO. It is less clear, however, how to designate areas adjacent to these locations. Examples include:

- a room that contains no radioactive materials except for the material contained in a glovebox
- a hallway outside a room that contains unencapsulated radioactive materials
- a room that uses a ventilation system also used by another room that contains unencapsulated radioactive materials
- a large area outside a much smaller area where operations with unencapsulated materials take place, but without obvious boundaries (e.g., walls) to delineate the RMMA.

None of these areas would normally be expected to contain radioactive contamination. However, it could be argued that there is the potential for contamination in each area, e.g., a glovebox that is a RMMA could leak, a

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person could become contaminated in a room that is a RMMA and contaminate the adjacent hallway after leaving the room, a reverse airflow situation could occur resulting in the introduction of contamination into a room from a ventilation system, or contamination could migrate away from an area where operations with unencapsulated sources take place. Although there is always the potential for these events to occur, there are two keys to whether the adjacent areas should be classified as RMMA: 1) whether physical and/or administrative controls are established to prevent the areas from becoming contaminated during routine operations, and 2) whether contamination surveys are periodically performed to demonstrate that the controls are effective. If both of these conditions exist, it is not necessary to classify the adjacent areas as RMMA. If contamination is found during a survey, then the area must be classified as a RMMA until the area has been decontaminated and the cause of the contamination (e.g., a breakdown in a specific physical and/or administrative control) is identified and corrected. If existing controls cannot ensure that contamination of these areas does not occur, classification of the areas must be based on the considerations described in the next section.

Areas that May Contain Incidental Levels of Loose Surface Contamination

Many DOE sites have areas that may contain very low levels of radioactive contamination from site operations, even though the areas do not contain unencapsulated radioactive materials and are not exposed to accelerator beams. In many of these cases physical and administrative controls designed to keep these areas free of contamination are not practicable. Examples include:

- areas adjacent to operations involving tritium, which can become contaminated due to air movement, personnel traffic, etc.
- outdoor areas where radioactive material released from stacks can be deposited under certain meteorological conditions
- areas which are not directly exposed to accelerator beams, but which may become slightly contaminated due to movement and deposition of activated dust particles
- areas which have very low levels of removable surface contamination due to past operations in that particular area or past or current operations in nearby areas, and for which complete and permanent decontamination is impractical.

If surface contamination levels in such areas exceed or have the potential to exceed DOE 5400.5 (Figure IV-1) criteria, or if airborne radioactivity levels exceed or have the potential to exceed the DOE Radiological Control Manual (Table 2-4) criteria for posting Airborne Radioactivity Areas, then the areas must be classified as RMMA. If the areas may contain surface contamination but only at levels less than these criteria, the approach is not as straightforward. The key issue in this case is whether hazardous materials being used or stored in these areas can become radioactively contaminated. If the levels of removable contamination in the areas are significantly less than DOE 5400.5 limits, it is unlikely that hazardous materials used or stored in

the areas would become contaminated to levels exceeding DOE 5400.5 limits for surface contamination. However, it may be possible for the hazardous materials to become contaminated in volume by the transfer of the area surface contamination to the materials. Because the PO criterion for volume contamination is no added radioactivity, then areas where it is possible to have volume contamination of hazardous materials from area surface contamination or from operations in other areas (e.g., from stack releases) would be required to be designated as RMMAs. However, sites can avoid classifying these areas as RMMAs if:

- documented process knowledge can be used to demonstrate that hazardous materials used or stored in these areas cannot become contaminated in volume; or
- documented routine radiological surveys demonstrate that contamination of the areas has not occurred; or
- the site demonstrates and documents via a waste generation study that wastes generated in the area will not become contaminated.

These processes for qualifying waste generation areas as non-RMMAs must be caveated. The status of the areas must be periodically re-qualified because conditions or activities in the areas may change over time.

An important consideration is that conservative yet reasonable scenarios are required to be evaluated for the potential to generate contaminated waste in these areas; unlikely or unreasonable scenarios are not of concern.

Areas that Contain Fixed Surface Contamination Only

Some DOE sites have areas containing fixed contamination but no removable contamination. This situation may have occurred after an area has been decontaminated to the extent possible, leaving only contamination that has become fixed to surfaces and cannot be removed without destructive measures. In some cases these surfaces may have been painted over to ensure that the contamination remains fixed. These areas are not required to be classified as RMMAs provided that sufficient process knowledge and/or physical controls are in place to ensure that the contamination will remain fixed. If it cannot be ensured that the contamination will remain fixed, then for the purposes of the PO it must be considered potentially removable contamination and the contaminated area is subject to the classification requirements described in the previous section.

Widespread Areas that are Contaminated from Past DOE Operations

At some sites there exists widespread radioactive contamination from past DOE operations. Examples include the Nevada Test Site, where much of the site is contaminated at various levels from nuclear weapons tests, and sites having tritium operations (Savannah River, LLNL, etc.), where past releases have resulted in elevated levels of tritium contamination in soil, groundwater, etc. In accordance with the PO, these areas could be considered RMMAs because

any hazardous waste originating in these areas could contain radioactive contamination as a result of DOE operations.

It is not the intent of the PO to prohibit the shipment of hazardous waste generated at DOE sites to commercial TSD sites. Rather, the intent is to ensure that any waste that is shipped does not contain radioactivity from DOE operations that is distinguishable from background radiation. The establishment of RMMAs is necessary to determine which wastes need to be evaluated for radioactivity and which do not. For example, because nuclear weapons fallout is omnipresent (albeit at different levels), it would not be reasonable to require entire DOE sites to be classified as RMMAs, because waste containing no radioactive contamination except above-ground nuclear weapons fallout would be indistinguishable from waste that never entered the DOE site. However, areas of widespread radioactive contamination from operations at specific DOE sites are a different matter. If hazardous materials/wastes were subject to this contamination, then the radioactivity in the wastes could, depending on the level of effort expended, be distinguished from the radioactivity present in the virgin material.

The key to this dilemma is the level of effort that would be required to demonstrate that the waste contains DOE-added radioactivity. The DOE is not interested in whether hazardous waste can be proven through heroic measures to contain insignificant quantities of DOE-added radioactivity. The DOE is interested in ensuring that hazardous waste shipped to commercial TSD facilities does not contain levels of radioactivity that would likely be detectable using reasonable and readily available measurement techniques. Therefore, areas of low-level widespread contamination need not be classified as RMMAs if the levels of contamination and operations in these areas are such that any resulting radioactivity in hazardous waste generated or stored in these areas would not be detectable using reasonable and readily available measurement techniques. This determination must be demonstrated, documented, and periodically revisited as discussed in the previous section on areas that may contain incidental levels of loose surface contamination.

Areas that are Prohibited from Containing Hazardous Materials

Some sites have proposed classifying certain areas that would normally be considered RMMAs as non-RMMAs based on the fact that no hazardous materials or wastes will be used or stored in those areas. This approach is not permissible because establishment of RMMAs is the fundamental mechanism to ensure that all hazardous waste that is potentially contaminated is properly evaluated for radioactivity. The decision as to whether hazardous materials are used or stored in an area can be based on whether the area is an RMMA, but should not be used to determine whether the area is a RMMA. Additionally, the PO and the criteria contained therein apply to sanitary waste as well as hazardous waste, although the shipping moratorium does not. Therefore, establishment of RMMAs shall be based on the presence of unencapsulated or unconfined radioactive material or the presence of beams capable of causing activation, not the types of operations permitted in these areas.

Establishment of Temporary RMMAs

Some sites have proposed establishing areas as RMMAs only during certain times, e.g., only when radioactive materials are present in the area or only when an accelerator is being used. This approach would allow hazardous materials to be used in these areas when the possibility of contamination does not exist and not be subject to surveying and/or sampling.

This approach is acceptable for certain areas provided that prior to the area being reclassified as a non-RMMA (see next section), it is ensured that the area is not contaminated. Areas that can be established as temporary RMMAs include areas that are accidentally contaminated (e.g., from a spill) and areas where sources are present infrequently. It is not acceptable to briefly classify as a non-RMMA an area that frequently contains unencapsulated radioactive materials or particle beams to avoid the survey/sampling requirements for hazardous materials used in RMMAs.

As stated previously, this approach is acceptable only when it can be assured that the areas are not contaminated before being reclassified as non-RMMAs. Upon removal of the radioactive source(s) from the area, the area must be decontaminated as necessary and demonstrated by surveys to be uncontaminated before it can be reclassified as a non-RMMA. The survey procedures must be adequate to ensure compliance with the requirements stated in the previous sections on areas with incidental levels of loose surface contamination and areas with fixed surface contamination.

Use of this approach is dependent on the proper management of hazardous waste present in the area when it is classified as a RMMA, i.e., the waste must be demonstrated to be non-radioactive by surveying/sampling or process knowledge according to approved procedures.

These requirements are also relevant to RMMAs being reclassified as non-RMMAs based on the permanent or long-term discontinuation of the use of unencapsulated radioactive materials or the discontinuation of operations involving beams of particles (see next section).

Declassification of RMMAs

Situations may arise in which areas classified as RMMAs no longer meet the criteria for definition of RMMAs as presented in the PO and this guidance. Such areas may include, but are not limited to; temporary RMMAs as discussed in the previous section, facilities from which source materials have been removed permanently, interminably, or for a prolonged period; and 3) facilities that contain no source materials and have been decontaminated to undetectable levels or levels meeting the unrestricted release criteria contained in DOE Order 5400.5

Reclassification of these areas as non-RMMAs is permissible provided that the following conditions have been met.

- adequate surveys and analysis have been performed and documented and are sufficient to demonstrate that waste subsequently generated within the areas will not become radioactively contaminated, and
- evidence that the area no longer meets the criteria for definition of an RMMA as presented in the PO and this guidance has been documented.

If the above conditions have been met, sites may reclassify areas without obtaining DOE approval provided that site procedures for reclassification have been approved as part of the overall site moratorium procedures package or as a separate submittal. If such approval has not been obtained, sites are required to obtain DOE field office approval before reclassifying any existing RMMA as a non-RMMA. This requirement includes facilities that have been decontaminated to levels sufficient for unrestricted release.

Other Considerations

Sites are encouraged to reexamine existing RMMA classifications to ensure that they are consistent with this guidance. Site visits performed to date have indicated that some areas have been inappropriately classified as non-RMMAs. Reclassification of areas as RMMAs does not require DOE approval; however, reclassification as non-RMMAs does require approval unless the conditions described in the previous section have been met.

It is recognized that despite this guidance, situations may exist which are difficult to resolve. In these cases, facilities are encouraged to contact EM-30 for further guidance.

Sites are reminded that although the moratorium does not apply to non-hazardous waste, the maxims of the PO should be applied to all waste generated in a RMMA as it is DOE policy to not release any radioactive waste off-site unless the person or firm receiving the waste is licensed to receive the radioactive component.

QA REVIEW AREAS

In meeting the quality assurance provisions of the EM-30 Performance Objective for Certification of Nonradioactive Hazardous Waste, DOE site programs should cover the following:

1. An overall QA program or plan per 10 CFR 830.120, DOE Order 5700.6C and/or ASME NQA-1, as appropriate, is applicable to waste management and characterization activities.
2. Detailed procedures are prepared to address the specific items of the EM-30 Performance Objective and the programmatic items of NQA-1 and the facility/activity QA plans.
3. Provisions are established for the training and qualification of personnel performing waste characterization, certification, handling, and management activities.
4. Provisions are established for the control of processes important to waste characterization and data quality (such as sampling, analytical methods, survey, etc.).
5. Provisions are established for the control of measuring, test, and analytical equipment used for characterizing the radioactive content of potentially radioactive hazardous waste.
6. Provisions are established for the identification and control of nonconforming conditions related to waste radiological characterization and handling activities and to assure effective corrective action is taken to resolve the nonconformances.
7. Provisions are established for the identification and control of records necessary to document the accomplishment of waste characterization, certification, packaging, and shipping.
8. Provisions are established for the verification that waste management activities are in compliance with the requirements of Federal and state regulations and the facility/activity QA plans.

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